An Australian Government Initiative

Cooperative Research Centres Program

Selection Round 17 (2014)

Impact Tool User Guide

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1. Introduction

1.1 Overview of the CRC Program

The Cooperative Research Centres (CRC) program supports medium to long-term end-user driven research collaborations to address major challenges facing Australia. CRCs pursue solutions to these challenges that are inventive, of high impact and capable of being effectively deployed by the end-users.

CRC program funding is awarded through a competitive merit based selection process and selection rounds are held on an annual basis. Applications are assessed by the CRC Committee (the Committee) against the three selection criteria of Research, Results and Resources and the committee makes funding recommendations to the Minister for Industry.

The assessment process is conducted in two stages. At stage one, applications are assessed by the CRC committee against the selection criteria and the committee makes recommendations to the Minister as to which applications should progress to stage two. At stage two, shortlisted applications are required to submit research project proposals for peer review and attend an interview conducted by a panel comprising members of the CRC committee and independent experts. At the conclusion of stage two, the CRC committee makes final recommendations to the Minister responsible for the program, who decides which CRCs will be funded.

1.2 What is a CRC?

A CRC is a collaboration of industry, research, government and community organisations that are working together to address a major challenge and deliver significant economic, environmental and social benefits to Australia.

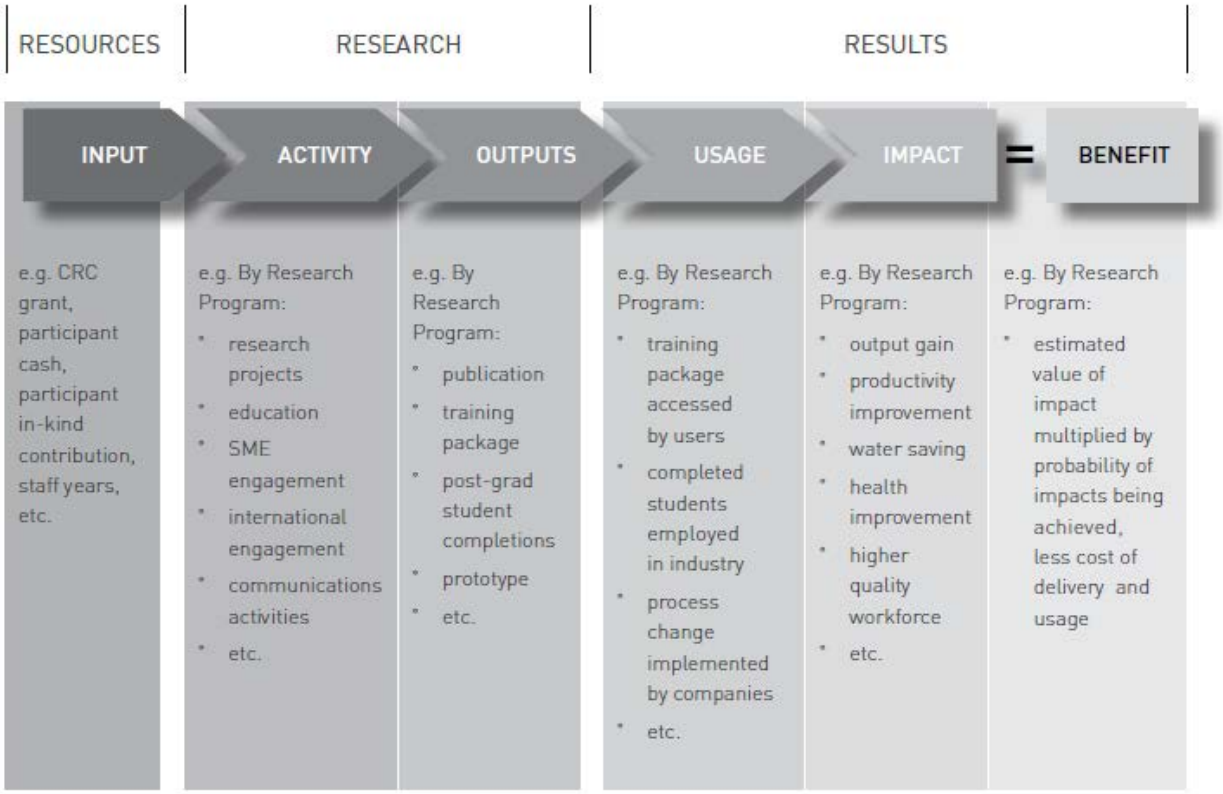
A CRC undertakes a number of research programs that each address a component of the major challenge. Each research program includes a number of research activities that contribute to achieving the overall objectives of the research program and major challenge.

1.3 Purpose of the Impact Tool

The Impact Tool forms an essential part of an application for CRC program funding.

A fundamental element of the assessment process is understanding the path from inputs to impact. Demonstration of this pathway is a key function of the Impact Tool.

The following diagram is taken from Attachment D of the CRC Program Guidelines and sets out a schematic of the input to impact chain model. It demonstrates a systematic grouping of information types.



The Impact Tool provides the applicant the opportunity to demonstrate the strategic planning behind an application and how the research and results are complementary to the CRC program's objectives. A clearly articulated and well justified Impact Tool, that clearly defines the relationships between research programs and projects and the path from research activity to impacts, is a crucial component of an application.

Another fundamental element of the Impact Tool is the identification of risk and the associated mitigation strategies of the research, usages and impacts. The Impact Tool is an opportunity for applicants to demonstrate a sound understanding of this.

The information contained in the Impact Tool can guide much of the detail included elsewhere in the application. Spending sufficient time and effort ensuring that the structure of the research programs and projects are correct will assist in completing other aspects of the application. The following are key aspects that will strengthen an Impact Tool:

- Demonstration of an understanding and clearly articulating the path from research activity through to monetary and non-monetary impact;
- Identification of all relevant risks and mitigation strategies on the path to impact;
- Linkages between research programs and projects clearly displayed;
- Justification of expected usage costs and impact benefits;
- Consistency between the Impact Tool and the other application documents; and
- Identification and justification of a range of expected non-monetary impacts.

It is important to note that the Committee recognises the difficultly in determining an accurate projected monetary value for usages and impacts. As such, the assessment will primarily relate to the identified path from input to impact as well as the justification for the monetary values provided as opposed to solely assessing the actual values themselves.

For successful applications, the Impact Tool is used to form the milestones of the Commonwealth Agreement between the CRC and the Commonwealth as represented by the Department of Industry (the Department). Clearly articulated, measurable and achievable descriptions of outputs and usages can significantly simplify the contract negotiation process

as the required information is readily available and suitable for inclusion in the Commonwealth Agreement.

CRC applicants are not expected to include every possible activity, output, usage and impact that they hope to deliver in the Impact Tool. Rather, for each research program within a proposal, applicants should include no more than five key activities, five key outputs, five key usages and five key impacts.

2. Getting started

2.1 Prior to entering information into the Impact Tool

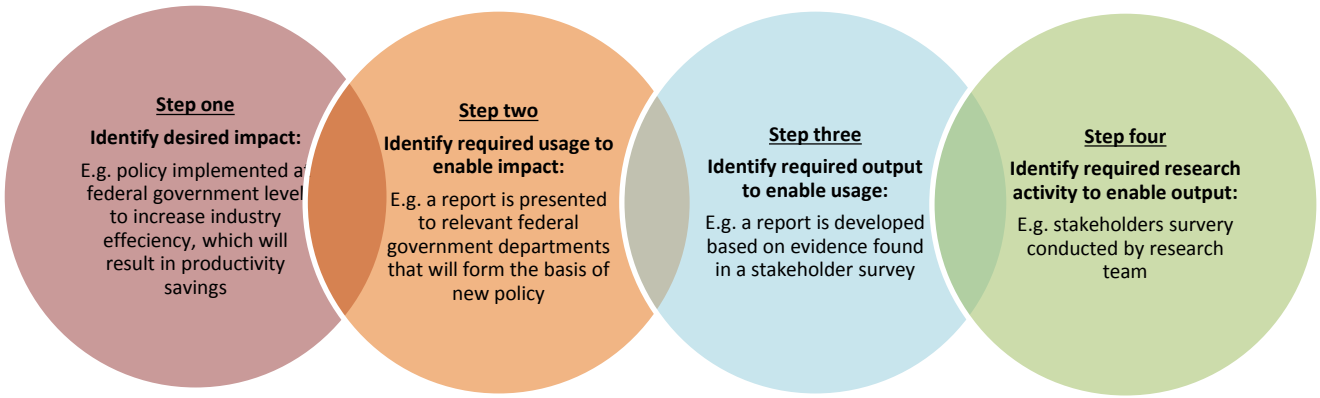
The planning process conducted prior to entering data into the Microsoft Excel spreadsheet, is critical to completing the Impact Tool and an application.

Applicants should firstly become familiar with this guide, the CRC Program Guidelines, the Application Instructions and the Impact Tool template to gain an understanding of the elements that are required to complete the Impact Tool.

2.2 Planning the structure of the Impact Tool

It is advisable that applicants conduct a planning session with participants including industry partners, to determine the research programs that will achieve the highest possible impact. This can be done through mapping the expected research programs that the CRC would conduct and within each of the identified programs, the research projects that once completed, would lead to outputs. Each output should have intended usages that would then result in impacts. Further details on what constitutes a research activity, output, usage or impact is provided in the specific sections of this guide.

The following example involves identifying a desired impact and required usage output and activity.



It is important to note that each of these steps should be supported by evidence that they can be achieved in the desired timeframe. For example, if federal government policy is a desired impact, then the relevant federal government departments may need to be involved in the proposal. If the relevant department is not involved, then the feasibility of the impact could be minimised and this could be a consideration by the Committee on the likely results of the proposal.

The structure of the Impact Tool can be simplified through a flow chart that shows the path from research activity through output, usage and impact. An example flowchart is shown at

Attachment A. This chart may also be useful for applicants at the planning stage of the Impact Tool.

It is important to note that for each research program, applicants can only provide five research activities, outputs, usages and impacts. As such, applicants should think strategically about what to include in the Impact Tool.

The applicant should also identify potential non-monetary impacts, as these can be included in the non-monetary impacts section of the Impact Tool and the Response to Selection Criteria.

2.3 How much interdependence should there be between research programs?

Some proposals will have significant interdependence between research programs and activities whilst others may only have links within research programs. Applicants should consider the complexity of the research programs, whether they are relevant to achieving the major challenge and the issues the interdependence may provide for the management team. While a complex structure may be required in order to achieve impact, the applicant should ensure that the management team and governance structure is appropriate to facilitate this arrangement.

It is vital that the associated risks with the structure of the proposed CRC are identified within the Impact Tool and that appropriate mitigation strategies are provided.

Once the applicant is satisfied with the structure and identified activities for the proposal, they can then commence inputting data into the Impact Tool.

3. Technical Guidance

3.1 Downloading the template

The Impact Tool template is available from the CRC Program website at www.crc.gov.au. The template contains macros that assist with the formatting of the Impact Tool.

To use the Impact Tool in Microsoft Excel, you will need to save the workbook as a 'macro enabled workbook' this means using the *.xlsm file extension rather than the *.xlsx extension. Depending on your Microsoft Excel security settings, you may be prompted to choose whether or not to 'Enable Macros'. You should select 'Enable Macros' to allow the template to operate.

The Impact Tool is intended to work on Microsoft Excel 2007, 2010 and 2013.

The template is not supported by Microsoft Excel for Macintosh 2008, which does not support any Microsoft Visual Basic macros. Applicants should, where possible, complete the template using a PC. The Department cannot guarantee the template will work without error on an Apple/ Macintosh platform.

To enable the spreadsheet to run successfully, it is recommended that you save the file to your hard drive and open the saved copy. Opening the spreadsheet from within a web browser may cause errors, resulting in the Impact Tool not working correctly.

When you are completing the template it is a good idea to save regularly.

3.2 Character limits and formatting

The character limits set within each sheet of the Impact Tool includes spaces. The cells include validation checks to ensure that the character limits are met therefore the limits must be adhered to. The formatting of boxes must not be changed.

3.3 Assistance with macros in Microsoft Excel (2007)

The Impact Tool macros may not be running due to the macro security settings within Microsoft Excel 2007. To change the settings so that macros can run within the Workbook you will need to follow the instructions below.

It is possible for a system administrator to lock the macro security settings. If this is the case you will need to contact your system administrator to change the settings. It is recommended that you reset the macro security settings once you have run the macros in each of the sheets for the Impact Tool.

1. Select the Developer tab. If the Developer tab is not visible, select the 'Office' button in the top left hand corner, click on the Excel Options button in the bottom ribbon, tick the box for "Show Developer tab in the Ribbon" and then select the 'OK' button.
2. In the Developer tab, select the 'Macro Security' button.
3. Select 'Enable all macros (not recommended; potentially dangerous code can run)'.
4. Select the 'OK' button.
5. The macros for the Impact Tool should now be enabled and run correctly.

3.4 Assistance with macros in Microsoft Excel (2010)

The macro security settings may need to be changed to ensure the Impact Tool operates successfully in Microsoft Excel 2010. To change the settings so that macros can run within the Workbook you will need to follow the instructions below.

It is possible for a system administrator to lock the macro security settings. If this is the case you will need to contact your system administrator to change the settings. It is recommended that you reset the macro security settings once you have run the macros in each of the sheets for the Impact Tool.

1. Select the 'File' tab and select 'Options' from the left side menu.
2. Select 'Trust Centre' and then 'Trust Centre Settings…'
3. Select 'Macro Settings' and ensure that an option other than 'Disable all macros without notification' is selected.
4. The macros for the Impact Tool should now be enabled and run correctly.

4. Completing the Impact Tool

4.1 Project Overview sheet

To commence setting up the template, applicants should select the Project Overview tab. Toward the top of this sheet is a macro button labelled 'Click to set up template'. Select this button and a prompt will appear asking you to 'Enter the total number of Research Programs'. Applicants should enter the number of research programs that their CRC will have and select OK.

A new prompt will then appear that asks applicants to 'Enter the name of the first Research Program'. Users should enter the name of the Program (no more than 30 characters) and then select OK. Users will then be prompted to enter the name of the second research program and so forth. Both the research program number and name must be consistent with what has been provided elsewhere to the department (i.e. in CRC Online and the Response to Selection Criteria etc.).

The macros will then configure the Project Overview and Inputs sheets of the template. This may take a few seconds, after which the two macro buttons 'Add additional research program' and 'Remove research program' will be enabled.

The Project Overview and Inputs sheets of the template are now ready to be populated with figures and text. More detail on what data/information to enter on these sheets is provided later in this guide.

It is important to note that the number of research programs must be populated prior to setting up the following sheets as the data entered may be lost.

4.1.1 Adding and removing research programs

Applicants may change the number of research programs after setting up the Impact Tool.

To add an additional research program the applicant should select the 'Add additional research program' button. They will then be prompted to enter the name of the additional research program they wish to add.

To remove a research program simply select the 'Remove research program' button and enter the number of the research program that needs to be removed.

Note: it is not possible to add or remove multiple research programs in a single operation. The applicant must repeat the operation described in order to add or remove more than one research program.

4.1.2 Editing the name of a research program

It is also possible to update the name of a research program after the worksheet has been set up without having to remove the existing research program.

To edit the name select the name of the program in the relevant text box under the Key Inputs column (columns B through K, immediately beneath the relevant Research Program number) on the Project Overview sheet and enter the updated research program name. The worksheet will automatically update the research program name on subsequent sheets in the Impact Tool.

Note you will need to manually change the name of the research program for the other four columns on the Project Overview sheet: Key Activities, Key Outputs, Key Usages and Key Impacts.

4.1.3 Entering information into the summary tables

It is recommended that applicants enter data into the summary tables once all other sheets have been completed as this will ensure the information on all pages is consistent.

4.2 Inputs Sheet

This page requires applicants to enter the total dollar value for cash, staff in-kind and non-staff in-kind resources allocated to each research program in whole dollar figures.

Resources (cash and in-kind) that do not fit within a specific research program should be allocated proportionally across the research programs. It is, however, a requirement that all resources are captured within the Impact Tool. The gross total of all programs in the Impact Tool should match the Total Income figure in the Budget overview of your application in CRC Online.

Values must only be entered in years where grant funding is being requested. Once a value is entered into the relevant field, a net present value (NPV) will be automatically calculated for the research program and application in the blue boxes.

4.2.1 What is the NPV?

The NPV provides a value today for an amount to be received or expended in the future. The assumed discounted rate in the impact tool is five percent per annum. In the Impact Tool the NPV is applied to the input costs, usage costs and impact benefits.

5. Activities sheet

5.1 Setting up the sheet

Before applicants commence the Activities sheet of the Impact Tool they need to consider the number of research activities they wish to include for each research program. No more than five activities can be entered for each research program.

When applicants are ready to configure the Activities sheet they should select the 'Click to set up sheet' button on the top left of the sheet. They will then be prompted to enter the number of research activities for research program 1. Once this is entered select 'OK' and then enter the number of activities for research program 2 and so forth. The macro will then configure the Activities sheet and the two macro buttons 'Add Additional Activity' and 'Remove Activity' will be enabled.

5.2 Changing the number of activities, outputs, usages and impacts

Applicants are able to amend the number of activities, outputs, usages or impacts after the Impact Tool has been set up.

To add a new output select the 'Add additional Output' button and then enter the number of the research program the new output is to be associated with. Click 'OK' and the Impact Tool will then reconfigure itself to include the additional output at the end of the relevant research program. For example to add a fourth output to the current 3 outputs in research program 2, enter 2 in the text field and Output 2.04 will be added to the worksheet.

To remove an output select the 'Remove Output' button and you will then be prompted to enter the number of the output to be removed. For example to remove output 1 from research program 1 the applicant would enter 1.01 in the text field. The Impact Tool will automatically renumber the remaining outputs. For example, if there are four outputs under research program 1 and output 1.03 is deleted, then output 1.04 will be renumbered to 1.03 after the Impact Tool has reconfigured itself.

The process for adding or removing an activity, usage or impact is the same as described for outputs.

Note that as in the case of adding and removing research programs it is possible to remove more than one output, usage or impact. However to do this the process must be repeated for each additional activity, output, usage or impact added or removed.

5.3 What should be included as a research activity?

The Committee expect a brief outline of the key research activities for each research program. This information should draw upon the information provided in the applicant's Response to Selection Criteria.

Applicants should also include a separate research activity for the education and training component of the research program. This should include aspects such as the PhD program, training initiatives and industry placements of students.

6. Outputs sheet

6.1 Setting up the sheet

Setting up the Outputs sheet follows much the same steps as the Activities sheet. Before applicants begin completing the Outputs sheet of the Impact Tool they need to consider the number of outputs they wish to include for each research program. No more than five outputs can be entered for each research program.

When applicants are ready to configure the Outputs sheet they should select the 'Click to set up sheet' button on the top left of the sheet. They will then be prompted to enter the number of outputs for Research Program 1. Once this is entered click OK and then enter the number of outputs for research program 2 and so forth. The macro will then configure the Outputs sheet and the two macro buttons 'Add additional Output' and 'Remove Output' will be enabled.

6.2 What should be included as an Output?

The outputs should be described in similar terms to those used in the Response to Selection Criteria. The outputs included will depend on the nature of the activities within the research program and may include such things as: publications, patents, trials, products, prototypes, technologies, training packages, PhD student commencements and completions, SME or international engagement.

Outputs are the desired outcomes of a project in order to enable usage by relevant partners. For example, if an anticipated usage is take-up of a new technology produced by the CRC, then the output for the project would be the production of the technology.

It is important to consider the viability of achieving an output in the specified timeframe which should be during the term of the CRC. For example, if an output requires a number of clinical trials to occur prior to the release of the final product, it is important to factor in the clinical trials to the key timeline of outputs.

Applicants are also required to 'insert the activity number(s) on which the output relies'. An output can rely on multiple research activities across research programs or solely on one to be achieved. This section has been included in order for the Committee to understand the link from research to output and how well the intended research relates to the desired outcomes.

6.3 How much detail should be provided for an Output?

The Committee need to be able to holistically understand what will be occurring during the life of the project in order to produce the output. As such, applicants should provide sufficient details within the output description and timeline of key milestones that will enable the Committee to understand the development stages of the output.

Whilst it is not always expected that detail will be included in each year of the timeline of key milestones, the Committee expect that sufficient consideration and planning has gone into identifying the intended outcomes. Providing only one milestone in the timeline or the same milestone multiple times, could indicate a lack of planning and due consideration.

It is important to note that outputs can only occur during the life of the CRC as this is when the CRC will be in place to manage outcomes.

A useful way to think about how much detail to include in an output, especially the timeline of key milestones, is whether it could be measured, is achievable and can be easily understood without expert knowledge. If successful, these outputs will form milestones in a Commonwealth Agreement between the applicant and the Department. CRC's are required to report against the milestones on an annual basis. As such, it is important to consider if the application were successful, whether the detail provided in the outputs is sufficient for these purposes.

7. Usage sheet

7.1 Setting up the sheet

Setting up the Usage sheet follows much the same steps as the Activities and Outputs sheets. Applicants should consider the number of usages they wish to include for each

research program before selecting the ‘Click to set up sheet’ button on the top left of the sheet.

There does not necessarily have to be one usage for each output. Some usages may require several outputs (potentially including outputs from across multiple research programs) or conversely a single output may have multiple usages.

Again, it is a wise idea to save the Impact Tool regularly, including before completing this step and after this sheet has been set up.

The Usage sheet is now ready to be populated with figures and text.

7.2 What is a usage?

Usage refers to the uptake, application or adoption of outputs by end-users. The end-users may include commercial users, community organisations, Government or individuals.

Important information to consider when describing a usage includes:

- the identity of the user of the output(s);
- the nature of the relationship (if any) between the user and the CRC;
- the mechanism by which the output(s) will be connected to the usage; and
- the level of effort required by the user to refine/adopt/apply the output(s).

Once the usage is determined, applicants must provide an expected cost associated with the usage taking into account the amount of time and effort required in order to achieve impact.

It is important to note here that the Committee understands that accurately determining all usage costs can be difficult. Applicants must engage with end users to determine the costs and provide a strong justification to support the claims. Usage costs are the costs borne by the end user in adopting the output, not the costs associated with developing the output.

The applicant should consider how applicable the usage is to the proposal and if it is realistic in the given timeframes with the identified collaboration. A common mistake made by applicants is including both usages and impacts that are not a result of the CRC activities or require large scale application by partners that are not involved in the proposal. For example, if the applicant proposes to develop a new product that will be utilised by companies from a sector that are not participating in a CRC. The risk that the usage may not occur will be increased as there is no clear commitment from relevant users of the product.

7.3 Selecting a risk rating

Applicants are asked to provide a risk rating associated with the risk that the required Outputs and Usages are **not** achieved. This allows the Committee to distinguish between the high-risk and low-risk outcomes of the proposal and to assess whether all associated risks have been factored into the bid.

For guidance on selecting a risk rating, please refer to the Risk Rating System section of the document.

7.4 What should be included in the timeline of key usage milestones?

The timeline of key usage milestones should include clear, factual and measurable descriptions for key milestones associated with the delivery and progress of each usage.

Whilst it is not expected that usage will occur in every year, the Committee do expect to see realistic and clear milestones where relevant.

7.5 What is a usage cost?

Usage costs refer to the costs incurred to use CRC outputs outside of any costs incurred by the CRC itself (which will have been captured in the CRC input costs sheet). When calculating the costs incurred by the user in using the given output, it is preferable that the end-user or relevant parties involved in the uptake of research outputs provide this figure. It should be noted that in cases where the output user needs to further develop, market test or trial the output prior to it being a final output ready for sale, distribution or application, the costs of usage may in fact be significantly higher than the costs incurred by the CRC in producing the original output.

It is difficult to predict what may or may not happen in the future and determining usage costs may be difficult. However, there is usually a body of evidence from which applicants may draw upon to support their assumptions. Knowledge of the industry in which the CRC is operating and a strong relationship with end-users should also assist applicants in determining usage costs.

CRCs will often not report usage during the early years of the CRC as it recognised that there is generally a lag time between developing outputs and the actual adoption or application of these outputs by end-users.

7.6 What should be included as a usage cost?

It is important for applicants to only include usage costs that are related to the desired impacts. This will ensure that the expected benefit to cost ratio is representative of the associated usages and impacts. For example, an applicant should only include the production costs incurred by an industry partner to the point where associated monetary returns will be realised.

In the case of a usage that is a result of outputs from multiple research programs, the usage cost should be split across the research programs in proportion to the relative significance of the outputs to the usage.

Applicants should ensure that where a usage cost is provided that an associated milestone is included in the timeline of key usages and visa-versa.

7.7 What is the difference between an output and a usage?

A common mistake made by applicants is in not differentiating between usages and outputs. Usage is a result of an output produced by the CRC. The difference between usages and outputs are demonstrated below:

Output	**Usage**
Evidence based report developed by CRC	Government department bases policy changes on evidence presented in report
New product developed based on research conducted by CRC	New product implemented by relevant businesses in their processes
10 PhD students complete training through CRC	10 students employed by industry
Training packages developed by CRC	Training conducted by relevant community organisations

8. Impacts sheet

8.1 Setting up the Impacts sheet

Setting up the Impacts sheet follows much the same steps as the other sheets. Applicants should consider the number of monetary impacts they wish to include for each research program before selecting the 'Click to set up sheet' button on the top left of the sheet. Applicants should also consider the relationship between the usages and impacts for each research program.

Similar to the relationship between outcomes and usages more than one usage may be required for an impact to occur. Similarly a usage may produce more than one impact.

Space for describing non-monetary impacts for each research program is provided after the each research program's monetary impacts section.

The Impact sheet is now ready to be populated with figures and text.

8.2 What should be included as a monetary impact?

Key monetary impacts should be included for each research program. These monetary impact examples should be briefly described in the appropriate cells.

Applicants are also expected to provide the details and quantification of the scale of impacts and how this quantification was reached. Impact may include productivity gains, industry development, environmental improvements and health and social benefits. These are not always easy to quantify, particularly in dollar terms. You will need to consult with end-users and access existing data sources in order to best quantify and justify impact values.

Monetary benefits should, wherever possible, be expressed in terms such as cost reductions for Government, profit increases for business, or increased lifetime consumption possibilities for individuals, as each of these benefits are broadly comparable in that they each increase consumption possibilities. Applicants should assign these benefits to appropriate years in the time period under consideration. The time period allocated for this reporting is 15 years from the first year of CRC funding.

Applicants should note that the monetary benefits refer to both valuations for public good and economic outcomes. Many public good outcomes, particularly in the health, environmental and social fields, are of course valued as ends in and of themselves. For instance, lower incidence rates of disease, preservation of the environment and improved social cohesion are valued as 'ends' in themselves rather than as 'means' to an economic end. However, it is often possible to also express (at least in part) such impacts in economic terms. For instance, improved health outcomes often translate to lower health costs and improved workforce participation rates that can be attached to a dollar value, preservation of the environment can have economic value through enabling sustainable tourism, improved social cohesion may facilitate lower crime rates and in turn lower costs in the criminal justice system, and so on. Applicants should attempt where possible to present such monetary valuations of impacts that are also valued as ends in themselves.

It is important for applicants to note that the impacts provided need to somewhat be measurable and accountable to the CRC. For example, the 'implementation of a new process in hospitals will reduce the government's expenditure on health care by five percent' is an impact that is very broad and could be achieved by a number of initiatives coinciding with the CRC's efforts and so it would be difficult to associate this with the CRC's activities and attribute the impact to CRC outputs. An appropriate impact description could be 'implementation of new process in hospitals will reduce required in-hospital patient care resulting in five percent efficiency savings for participating hospitals.'

It is accepted that in a real world situation, few of the impacts you might consider have only one cause, i.e. can be completely attributable to usage(s) of the CRC's output(s). Even if it is

possible to identify the other factors or resources involved in a particular impact, it is unlikely that exact quantification will be viable. However, acknowledgement that other factors will likely contribute to an impact, including a transparent attempt to account for it, is important when calculating the impact and the dollar value assigned to the CRC. For instance, if the CRC expects to be one of three key equal contributors to an impact, it may only enter a third of the monetary value of the total net impact when completing the Impact sheet of the template.

Applicants should also note that when quantifying a value of an impact for a beneficiary, it is the 'net' benefit rather than the 'gross' benefit that should be recorded if access to the benefit involves some additional costs (beyond those already described in the cost of usage in the usage sheet) being incurred. For instance, for a patient to benefit from a new medical diagnostic test the patient (or the government on the patients behalf) may need to pay to access the test. In this case the net benefit for patient is the value of the gain of better health outcomes minus the cost to the patient of accessing the test. The gross benefit, by contrast, would simply be the value of the health benefits.

In this example, the price paid to access the test may itself be a separate impact example, where the producer of the test gains a net benefit of the income received for the test minus the cost to the provider of supplying the test.

It is acknowledged that quantifying the final impact of research is the most uncertain of the stages and, again, it must be stressed that it is not the 'number' attached to impacts by applicants that will be the primary focus of the Committee, but rather the quality of the thinking that underpins it.

8.3 Selecting a risk rating

Applicants are asked to provide a risk rating associated with the risk of usage(s) **not** occurring to enable impact (Required usages risks) and the risk of impact **not** occurring (Impacts risks).

For guidance on selecting a risk rating, please refer to the Risk Rating System section of the document.

8.4 What should be included as a non-monetary impact?

In addition to description and quantification of monetary impacts (including the monetary valuation of public goods), in recognition of the often considerable non-monetary impacts that CRCs generate, applicants are expected to provide for each research program a clear description of any such non-monetary impacts. For instance, a new medical approach that saves lives is valued in non-monetary terms as a benefit in itself.

Applicants should think in terms of 'what is valued' by society as a benefit, whether it be better health, social connections, a sense of security, environmental quality and so on when discussing the non-monetary aspects of the impacts that a CRC may generate.

Non-monetary impacts may be linked to some monetary impacts or may be completely independent of any monetary impacts. Where the non-monetary impact is related to a previously described monetary impact, the applicant should note this in the response cell.

For each research program, space is automatically provided to comment on important non-monetary impacts.

9. Risk rating system

An important function of the Impact Tool is assessing the risks associated with the proposal and how these can be mitigated.

A CRC is managed by a governing board that oversees the CRC including the functioning of research programs, Commonwealth compliance requirements and management of relationships with participants and other relevant stakeholders. A key function of the board is the management of risk on all aspects of the CRC. Risk management is an area to which the Committee pay particular attention to in both the application and systematically throughout the life of the CRC.

The Impact Tool requires that the applicant include the risk to the outputs, usages and impacts being successfully completed.

9.1 Selecting a risk rating

Applicants have five risk ratings to select from a drop down menu. The risk rating section of either 'very low', 'low', 'medium', 'high' and 'very high' should take into account the descriptors provided below and be further explained by the applicant in the associated text boxes on the Usages and Impacts sheets.

As the risk rating selected is the risk of the outcome, usage or impact **not** occurring, a risk rating of 'very low' would indicate a very high probability of success and 'very high' would indicate a very low probability of success. The Impact Tool will automatically calculate a risk adjusted NPV value at the bottom of the sheet based on the risk ratings selected. The following values will be used:

Risk rating	**Probability of success value used for calculating risk adjusted NPV**
Very low	95%
Low	75%
Medium	50%
High	25%
Very high	5%

As applicants only have the option of selecting one of five values, the Committee understands that the final risk adjusted NPV monetary costs and benefits at the bottom of the Usages and Impacts sheets will be an approximate value. This will be taken into consideration when assessing applications. The purpose of providing usage costs and monetary benefits is primarily to assess the level of understanding of the associated usages and impacts, the level of planning that has gone into providing these values and a rough indication of the expected return of the research program, not necessarily the accuracy of the monetary values provided.

Selecting a high risk rating for an output, usage or impact is not necessarily a negative choice as high risk activities often have high returns associated with them.

Applicants should consider the below risk rating descriptors prior to selecting a risk rating.

9.2 Risk rating descriptors for outputs risks

Applicants are required to determine a risk relating to the required output(s) **not** being produced on the Usages sheet. The following provides descriptors to assist in determining the risk rating and should be used when selecting an outputs risk rating:

Very low

- Very strong track record of researchers delivering outputs.
- Very low degree of project specific management risk present as participants have a very strong track record of effective collaboration.

- Research is in a field where delivery of output "success" is almost certain.
- Output reflects a minor addition to existing knowledge.
- Being first to produce an output is not important to its usage potential.
- There are limited known direct competitors pursuing a similar research agenda and they are much less advanced than the CRC applicant.
- CRC applicant has an absolute competitive advantage in this area.
- Any loss in participants or key personnel can be replaced with no impact on achieving outputs.

Low

- Strong track record of researchers delivering outputs.
- Low degree of project specific management risk present as participants have strong track record of effective collaboration.
- Research is in a field where delivery of output "success" is likely.
- Output reflects incremental addition to existing knowledge.
- Being first to produce output is not of high importance to its usage potential.
- There are few known competitors pursuing a similar research agenda and they are less advanced than the CRC applicant.
- CRC applicant has distinct competitive advantage in this area.
- Any loss in participants or key personnel can be replaced with minimal impact on achieving outputs.

Medium

- Moderate track record of researchers delivering outputs.
- Some degree of project specific management risk present as CRC participants do have some record of output delivery through collaborative arrangement.
- Research is in a field where delivery of output "success" is possible.
- Output reflects a significant advance on existing knowledge.
- Being first to produce the output could be beneficial but not critical to its usage potential.
- There are some known competitors pursuing a similar research agenda but they are less advanced than the CRC applicant.
- CRC applicant has some competitive advantage in this area.
- Any loss in participants or key personnel can be replaced but would cause delays on achieving outputs.

High

- Limited track record of researchers delivering outputs.
- High degree of project specific management risk present as CRC participants have limited history in collaborating together or where the CRC proposes to collaborate with other entities over which it has little influence.
- Research is in a field where delivery of output "success" is unlikely.
- Output would represent a highly developmental and innovative change to existing knowledge or situation.
- Being in the first mover group is critical to its usage potential.
- There is known competitors pursuing a similar research agenda.

- CRC applicant has a limited level of competitive advantage in this area.
- Any loss in participants or key personnel could not be replaced and would result in significant delays in delivering outputs.

Very High

- No track record of researchers delivering outputs (perhaps because research field is in very early stage of development).
- Very high degree of project specific management risk present as CRC participants have not previously collaborated or where the CRC proposes to collaborate with other entities over which it has little to no influence.
- Research is in a field where delivery of output "success" is rare.
- Output would represent a pioneering change to existing knowledge or situation.
- Being first to produce output is critical to its usage potential.
- There are several known competitors pursuing a similar research agenda.
- CRC applicants have minimal competitive advantage in this area.
- Any loss in participants or key personnel would not be replaced and would cease any delivery of outputs.

It is not a requirement for the risk rating selected for the required Output(s) to meet all the criteria specified within each descriptor. For example, if the Output is a pioneering step within the field of research but the applicant has some distinct competitive advantage in the field, the applicant could select a ‘high’ risk rating, as this rating is a midpoint between the ‘very high’ and ‘medium’ options. It is important to justify the rating selected in the associated text box especially in describing why it is relevant to the Output.

9.3 Risk rating descriptors for usages risks

Applicants are required to determine a risk rating for the usage **not** occurring (assuming that required outputs are produced) on the Usages sheet. The following table provides descriptors to assist in determining the risk rating and should be used when selecting a usage risk rating:

Very Low

- Research usage in the relevant field is very common.
- Substantial past track record of applicant researchers having outputs adopted by end-users.
- Strong past track record of engagement with planned end-users and the majority of these end-users are essential participants of the proposed CRC.
- Distribution channel capability for the proposed outputs is a strong component of the proposal and/or existing distribution channels can be used and incentives have been factored in to achieve this.

Low

- Research output usage in the relevant field is common.
- Sound past track record of applicant researchers having outputs adopted by end-users.
- Good past track record of engagement with planned end-users and most of these end-users are participants of the proposed CRC.

- Distribution channel capability for the proposed outputs is a component of the CRC proposal and/or existing distribution channels can be used.

Medium

- While research output usage in the relevant field is not uncommon, it is not standard practice.
- Evidence of past track record of applicant researchers having outputs adopted by end-users.
- At least some past track record of engagement with planned end-users and some of these end-users have a relationship with the proposed CRC.
- Distribution channel capability for the proposed outputs is part of the CRC proposal and/or existing distribution channels can be developed for the proposed outputs.

High

- There are few examples of research outputs in the relevant field that have been adopted by end-users.
- Limited past track record of applicant researchers having outputs adopted by end-users.
- Limited past track record of engagement with planned end-users and these end-users have limited relationship to the proposed CRC.
- Distribution channel capability for the proposed outputs is limited but can be further developed.

Very High

- There are no examples of research outputs in the relevant field that have been adopted by end-users.
- No track record of its researchers having outputs adopted by end-users.
- No past track record of engagement with planned end-users and these end-users have no relationship to the proposed CRC.
- Distribution channel capability for the proposed will need to be developed and established.

9.4 Risk rating for usage occurring to enable impact

Applicants are required to determine the risk of usage(s) **not** occurring to enable impact on the Impacts sheet. This risk is a result of the relevant Risk of Outputs and the Risk of Usages for each usage associated with the impact. Thus, the risk rating selected in this drop down box must be consistent with the risk rating(s) provided in the associated Usage(s). In order to determine the appropriate risk rating, applicants must refer to the appropriate probability value associated with the risk rating selected in the associated usages.

In order to assist in determining the appropriate risk rating, three examples are provided below.

Example One

If Impact 1.01 requires only one usage - Usage 1.01(where output risk is low and usage risk is low) - to occur, then the risk of the usage not occurring to enable impact would be determined as follows:

Usage 1.01	Usage 1.01	Impact 1.01
Outputs Risks	Usages Risks	Risk of Usage(s) not occurring to enable impact
Low	Low	Medium
75%	75%	75% x 75% =56%

Example Two

If Impact 1.01 requires two usages to occur - Usage 1.01(where output risk is medium and usage risk is high) and Usage 1.02 (where output risk is medium and usage risk is high) - then the risk of the usages not occurring to enable impact would be determined as follows:

Usage 1.01	Usage 1.01	Usage 1.02	Usage 1.02	Impact 1.01
Output risk	Usage risk	Output risk	Usage risk	Risk of usages not occurring to enable impact
Medium	High	Medium	High	Very High
50%	25%	50%	25%	(50%x25%) x (50%x25%) =1.6%

Example Three

If Impact 1.01 requires either one of several usages to occur - Usage 1.01(where output risk is medium and usage risk is high) and Usage 1.02 (where output risk is medium and usage risk is high) - then the risk of the usages not occurring to enable impact would be determined as follows:

Usage 1.01	Usage 1.01	Usage 1.02	Usage 1.02	Impact 1.01
Output risk	Usage risk	Output risk	Usage risk	Risk of usages not occurring to enable impact
Medium	High	Medium	High	High
50%	25%	50%	25%	1-[(1-(50%x25%)) x (1-(50%x25%))] =23%

In this example the calculation is based on one minus the probability of neither usage occurring. This is equal to the probability of both usages occurring plus the probability of usage 1.01 occurring plus the probability of usage 1.02 occurring.

If the impact relies upon a specific combination of usages then a specific combination of the above formulas would be required.

It is important for applicants to clearly justify in the associated text box for the required usages risks why the end-users can deliver these usages and the methodology behind the calculation of the risk rating. In addition, the applicant should discuss the relationship between the usages (if more than one is required to enable impact) and how they will collaboratively achieve the impact.

9.5 Risk rating descriptors for impacts risks

Applicants must then provide a risk rating (assuming the required usage(s) have successfully occurred) for each monetary impact provided. This risk rating, Impacts Risks is the risk that, assuming the required usages have taken place, the desired impact is **not** realised.

It should be noted that in many cases, determining the risk rating will be substantially more difficult than estimating the other risks along the input to impact chain. This is because the

majority of factors influencing delivery of expected impacts are well beyond the control of CRCs, and will often be inherently unpredictable. When assigning a risk rating, applicants should consider how risk factors such as changes in the market for products or processes; externals factors such as drought, flood, recession, change of government; changes to consumer preferences or the presence of rival products or processes may reduce or enhance the chance that usage(s) will deliver expected impacts.

The following guidance should be used when selecting an Impacts risk rating:

Very Low

- Any contingent external factors are very likely to occur.
- There is a very high level of certainty about the process and timeframe for translation of usages to benefits.
- The CRC will have a high level of control over the realisation of benefits.
- The impact is not competing against products or processes in an open market that has a need for the product or process.
- The user of the output has a strong track record of making planned impacts.

Low

- Any contingent external factors are likely to occur.
- There is a high level of certainty about the process and timeframe for translation of usages to benefits.
- The CRC will have a reasonable level of control over the realisation of benefits.
- The impact is not competing against products or processes in the market.
- The user of the output has a good track record of making planned impacts.

Medium

- Any contingent external factors may occur.
- There is a moderate level of certainty about the process and timeframe for translation of usages to benefits.
- The CRC will have some control over the realisation of benefits.
- The impact is competing against some products or processes in the open market.
- The user of the output has some track record of making planned impacts.

High

- Any contingent external factors are unlikely to occur.
- There is a low level of certainty about the process and timeframe for translation of usages to benefits.
- The CRC will have limited control over the realisation of benefits.
- The impact is competing against multiple similar products or processes in the market.
- The user of the output has minimal track record of making planned impacts.

Very High

- Any contingent external factors are very unlikely to occur.
- There is a very limited certainty about the process and timeframe for translation of usages to benefits.
- The CRC will have no control over the realisation of benefits.

- The impact is competing against multiple products or processes in a saturated market.
- The user of the output has no track record of making impacts.

10. Benefit to Cost Calculator sheet

10.1 Setting up the sheet

Once the applicant has selected the 'Click to set up sheet' button, the Benefit:Cost sheet will automatically self-populate the numerical cells by drawing data from the other previously completed sheets.

This sheet provides the monetary benefit:cost ratio of each research program and the overall projected monetary benefit:cost ratio for each CRC. Applicants should note that the figure shown in the monetary benefit:cost calculation is not a selection criterion on its own.

As with all elements of the Impact Tool, it is important for applicants to bear in mind that rather than just the numbers presented being the key focus, it will be the quality and rigour of the analysis that underpins the numbers that will be a far more important focus in the selection process. It is well understood, that for a forward estimate of impacts from research, the actual numbers themselves can at best provide a rough estimate and that the numbers will therefore be viewed by the Committee in this context.

10.2 What is an appropriate expected benefit to cost ratio?

As mentioned above, the Committee understand that the final estimated projected monetary benefit:cost ratio for each CRC is difficult to determine and as such will not be viewed in isolation. However, the final value should be realistic to the relevant sector and demonstrate sufficient planning has gone into formulating a projected gross impact of the CRC.

The overall expected return (with risks and time value of money fully accounted for) on public funded R&D over a fifteen year time period can be expected to be in the order of $1 - $3 of net benefits for every $1 of resources allocated. If applicants present projections of risk adjusted expected net benefit ratios significantly higher than this, then strong evidence would also be expected to support higher returns.

11. Additional Information sheet

This sheet is provided for applicants to use if they feel that the response boxes provided in previous sheets do not allow sufficient space for them to address the topic. The additional information sheet provides up to two additional pages of free text response space for applicants to use if required. Applicants should cross reference material to appropriate places in the proceeding sheets.

Also, given that applicants can cross-reference within the Impact Tool to other application documents, it is not anticipated that many applicants will need to use all of the space provided in these two additional pages.

12. Attachment A
Impact Tool flowchart from activity to impact